THE FEDERAL AID HIGHWAY ACT OF 1956 - ITS IMPLICATIONS, BENEFITS AND THE PROBLEM OF HIGHWAY COST ALLOCATION

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by

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Joint Highway Research Project

PURDUE UNIVERSITY
LAFAYETTE INDIANA

TECHNICAL PAPER

THE FEDERAL AID HIGHWAY ACT OF 1956— ITS IMPLICATIONS, BENEFITS AND THE PROBLEM OF HIGHWAY COST ALLOCATION

TO: K. B. Woods, Director
Joint Highway Research Project

December 18, 1957

FROM: H. L. Michael, Assistant Director

File: 3-1

Attached is a paper entitled, "The Federal Aid Highway Act of 1956— Its Implications, Benefits and the Problem of Highway Cost Allocation," by Professor A. K. Branham. The paper discusses the major provisions of the 1956 Federal Aid Highway Act and discusses some of the problems resulting from the highway program. The paper was presented at the 43rd Annual Meeting of the American Association of State Highway Officials in Chicago on November 20, 1957.

The paper is submitted for the record.

Respectfully submitted,

Harold L. Michael

Harold L. Michael, Assistant Director
Joint Highway Research Project

HLM:hgb

Attachment

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Technical Paper

THE FEDERAL AID HIGHWAY ACT OF 1956 -- ITS IMPLICATIONS, BENEFITS AND THE PROBLEM OF HIGHWAY COST ALLOCATION

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Purdue University
Lafayette, Indiana

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THE FEDERAL AID HIGHWAY ACT OF 1956 — ITS IMPLICATIONS, BENEFITS AND THE PROBLEM OF HIGHWAY COST ALLOCATION[1]

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Introduction

The Federal-Aid Highway Act of 1956 and its companion bill, the Highway Revenue Act of 1956, approved June 29, 1956, as Public Law 627 of the 84th Congress, initiated significant changes in federal responsibility for the development of highways in the United States. Appropriations for all Federal Aid Systems were increased, but greatest emphasis was placed upon providing funds to complete the National System of Interstate and Defense Highways by 1972. The Highway Act also provided that the standards of the Interstate System are to be adequate to accommodate the types and volumes of traffic forecast for the year 1975.

Major Provisions of the Federal Aid Act of 1956

The financial provisions are presented in Table I, Authorization of Appropriations. The major provisions of the Federal Aid Highway Act are summarized as follows:

1. It authorized an expenditure of about $25 billion in federal funds for the development of the 41,000 mile Interstate System (1957-69). The federal government will contribute 90 percent of the funds, and the states will contribute 10 percent of the funds allocated for constructing the Interstate System. In some states, the federal contribution may be between 90 and 95

[1]Presented at the 43rd Annual Meeting, American Association of State Highway Officials, Chicago, Illinois, November 1957.

TABLE I. AUTHORIZATION OF APPROPRIATIONS (1956 Act)
(In Millions of Dollars)

Fiscal Year	1957	58	59	60	61	62	63	64	65	66	67	68	69
Interstate	1175[a]	1700	2000	2200	2200	2200	2200	2200	2200	2200	2200	1500	1025
Other Federal Aid Systems (Primary, Secondary and Urban)	825[b]	850	875										
Forest Highways		30	30										
Forest Development Roads and Trails		27	27										
Roads and Trails in National Parks		16	16										
Parkways on U.S. Lands		16	16										
Roads in Indian Reservation Lands		12	12										
Public Lands Highway	2[c]	2	2										
Emergency Fund	30[d]	30[d]	30[d]										

[a] Includes $175 million (1954 Act)

[b] Includes $700 million (1954 Act)

[c] In addition to previous authorization

[d] To be replenished annually

SOURCE: Federal-Aid Highway Act of 1956, Public Law 627, 84th Congress, 2nd Session.

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percent, depending upon the public land provision of the law. These funds may be used for the purchase of right-of-way, for utility relocation, and for construction. Until 1959, funds are to be appropriated to the states on the basis of population (2/3), area (1/6), and mileage (1/6). After 1959, these funds are expected to be apportioned on a "needs" basis, depending upon the percentage of the Interstate mileage not completed in each state.

2. It authorized an expenditure of about $2.55 billion on the other Federal Aid Systems (Primary, Secondary, and Urban) during the three-year period 1957-59. These authorizations continue, as in the past, to provide 45 percent for the Federal-Aid Primary System; 30 percent for the Federal-Aid Secondary System; and 25 percent for the extension of these highways in urban areas. The allocations for these systems continue to be based on the previously established formulas for distribution of the funds to the states. Upon request of the State Highway Department not more than 20 per cent (1954 Act provided for 10 per cent) of the authorization for each of the several Federal Aid Systems (Interstate excluded) within a state may be transferred to another eligible system if approval is granted by the Governor of the State and by the Secretary of the U. S. Department of Commerce. Authorization of funds for these Federal Aid Systems extends only through the fiscal year 1959.

3. It provides for an expenditure of about $206 million for forest highways, forest development roads and trails, roads and trails in national parks, parkways on U. S. lands, roads on Indian reservations and lands, and public land highways during fiscal years 1957-1958.

4. An emergency fund of $30 million per year, to be replenished on an annual basis, was established on a 50-50 matching basis for repair

and reconstruction of federal aid highways damaged by floods, hurricanes, earthquakes, etc.

5. It imposes conditions of the Davis-Bacon Act on minimum wage rates for construction of the Interstate System. Workers shall not be paid less than prevailing rates in the area for similar type work.

6. It places size and weight limitations on vehicles using the Interstate System (width, 96 inches; single-axle load, 18,000 pounds; tandem-axle load, 32,000 pounds; and maximum gross weight of 73,280 pounds or the limits in effect in each State on July 1, 1956 - whichever is the higher).

7. The law provides for financing the program on a pay-as-you-go basis from a special Highway Trust Fund into which will be placed approximately $38.5 billion from certain new and existing highway-user revenues over a 16-year period (1956-1972). A summary of this section is shown in Table II, Estimated Receipts, Expenditures, and Balance of Highway Trust Fund, Fiscal Years 1957-72. In addition to the $25.1 billion in federal funds to be expended on the Interstate System, a sum of $13.4 billion in federal funds is to be spent on the other Federal Aid Systems by 1970. The latter figure assumes expenditures of $900 million per year after 1959. Increased or new taxes, expected to provide $14.8 billion, are levied on gasoline, diesel, and special motor fuels (increased from 2 cents to 3 cents per gallon); tires (increased from 5 cents to 8 cents per pound); tread rubber or camelback (new tax at 3 cents per pound); new trucks, busses, and truck trailers (taxes increased from 8 per cent to 10 per cent of manufacturer's price); and vehicles over 26,000 pounds gross weight (new tax of $1.50 per year for each 1,000 pounds of taxable gross weight over 26,000 pounds).

TABLE II

ESTIMATED RECEIPTS, EXPENDITURES, AND BALANCE OF HIGHWAY TRUST FUND, FISCAL YEARS 1957-72

(In millions of dollars)

Fiscal Year	Receipts (including interest, after deduction of refunds)	Expenditures			Status of Trust Fund	
		Interstate	Primary, secondary, and urban [1]	Total	Annual net credit (+) or charge (-)	Balance, credit (+) or debit (-) at end of year
1957	1,542	300	750	1,050	+492	+492
1958	2,070	1,100	800	1,900	+170	+662
1959	2,118	1,500	850	2,350	-232	+430
1960	2,159	1,600	900	2,500	-341	+89
1961	2,206	1,395	900	2,295	-89	---
1962	2,258	1,358	900	2,258	---	---
1963	2,313	1,413	900	2,313	---	---
1964	2,370	1,470	900	2,370	---	---
1965	2,429	1,529	900	2,429	---	---
1966	2,490	1,590	900	2,490	---	---
1967	2,553	1,653	900	2,553	---	---
1968	2,619	1,719	900	2,619	---	---
1969	2,686	1,786	900	2,686	---	---
1970	2,755	1,855	900	2,755	---	---
1971	2,826	1,926	900	2,826	---	---
1972	[2] 3,139	2,941	198	3,139	---	---
Total	38,533	25,135	13,398	38,533	---	---
Average	2,408	1,571	837	2,408		

1 Assuming primary, secondary, and urban authorizations totaling $900 million annually, fiscal years 1960 to 1972, inclusive.

2 Includes receipts and refunds after June 30, 1972, of taxes and refunds accrued on or before that date.

Source: House Document 105, 85th Congress, 1st Session, "Federal Condition and Results of Operations of Highway Trust Fund."

8. It provides that the Territory of Alaska, for the first time, will share in the funds for primary and secondary roads and that the responsibility for road construction in Alaska is removed from the Department of the Interior and placed in the Department of Commerce.

9. The definition of the term "construction" was amended to insert after "mapping" the following: "(including the establishment of temporary and permanent geodetic markers in accordance with specifications of the Coast and Geodetic Survey in the Department of Commerce)." The significance of this change is presented in a recent report issued by the Committee on Highway and Bridge Surveys of the Surveying and Mapping Division of the American Society of Civil Engineers. It is claimed that "it is no longer economically defensible to execute highway surveys with the short-range objective of serving only the immediate needs of construction nor to base them on assumed horizontal and vertical datums. The modern highway survey when governed by high accuracy standards and when properly monumented and described can provide for all-time adequate reference controls for future reconstruction and betterment programs, when tied into and properly adjusted to the national systems of horizontal and vertical control, with horizontal positions expressed in terms of state plane coordinates, such surveys can serve the country's domestic economy and aid her defense in the event of war."

Pending Studies

To facilitate future planning and to guide the administration of the highway program, Congress, through the Federal Aid Highway Act of 1956 requested the Bureau of Public Roads to investigate several major problem areas. The areas to be investigated and the dates the reports are to be submitted to

Congress are summarized as follows:

1. Due January 1958 - A more accurate estimate of the cost of completing the Interstate System (last one made in 1954).
2. Due January 1958 - A study to aid Congress in establishing a policy for reimbursement of states for highways constructed in the period 1947-57 and considered eligible for inclusion in the Interstate System. Toll roads and free roads, if constructed to approved standards, will be included in this category.
3. Due March 1959 - An incremental cost study, or comparable study, to determine the cost of building roads to meet the needs of various classes of users. This report can be used by Congress to determine and establish an equitable distribution of the tax burden among various classes of vehicles using the federal-aid highways.
4. Due March 1959 - A study to determine the economic sizes and weights of motor vehicles. A progress report is due early in 1958.
5. Due March 1959 - A study to determine what the federal government can do to increase highway safety with emphasis on finding the causes of accidents and their relationship to highway design.

Studies by Bureau of Public Roads and Others

The above studies are currently in progress in the Bureau of Public Roads. In addition, several agencies are cooperating with the Bureau of Public Roads in completing these studies in the required time. A multi-million dollar test road project at Ottawa, Illinois, sponsored by the American Association of State Highway Officials is in progress to facilitate the study of the action of single and tandem-axle loads of varying intensities on rigid and flexible pavements, and on 16 types of test bridges. The test will attempt to correlate highway design and highway cost with size and weight of vehicles. It will also attempt

to provide criteria for the economical design of new pavements and to evaluate existing facilities. The data from the AASHO test were to be used in conjunction with data from a study of vehicle operating cost currently in progress by the Highway Research Board's Committee on Economics of Vehicle Size and Weight. Unfortunately, the test project at Ottawa, Illinois, does not appear to have progressed far enough to contribute significantly to the Bureau of Public Roads studies, which are due March, 1959.

An investigation by a Special House Subcommittee on Highway Safety is expected to complement Safety Studies conducted by the Bureau of Public Roads. Furthermore, the Interstate Commerce Commission, in a 1957 study to determine compliance of trucks with safety regulations, found that nearly 20 percent of those examined could not pass the safety check. This study may contribute significantly to design specifications and to the safety requirements that may be imposed upon highway motor transport.

Some Implications of the New Highway Program

The federal highway program will contribute significantly to the development of a balanced highway system that is adequate to meet the needs of agriculture, commerce, industry, and the national defense. It will have a profound effect upon the entire economy of the country and the construction industry in particular. Some of the economic impacts will occur in the areas of urban redevelopment, industrial and commercial construction, residential building, sewerage and waterworks, rapid transit, and other forms of transportation.

The highway program is affecting our economy because:

1. Increased total road construction is to be financed by Federal highway user taxes on a pay-as-you-go basis.
2. A large proportion of traffic from present arterial roads and streets will be shifted to the Interstate System. These limited access

facilities will route traffic around or across cities via expressways.

3. Reduction of congestion and the more economical movement of traffic.

The program has many implications which are less obvious. The indirect or transferred benefits are typical and may be illustrated by changing land uses and values as well as the shifting of the tax base.

The program is not without problems. About one-half of the money is to be spent in urban areas where about two-thirds of the national population currently lives and where three-fourths may live in 1975.

Highway engineers when planning new highway locations are indirectly planning land use. Cooperation between the highway engineer and the city planner and others is urgently needed. Most of the Interstate System will be relocated near its present location. Little effort is being directed by planners and engineers toward the shifting of major highways and population centers to areas where highly productive agricultural lands will not be assimilated in the process of expansion. Should the engineer and city planner continue negative conservation of land or should they foster the optimum use of land? Should they continue land pollution? Can they best plan to use the marginal and less productive lands of the valleys of such rivers as the Illinois, Wabash, Ohio, Missouri, Mississippi, and the Tennessee by creating new and better highways to supplement other forms of transportation and to more effectively serve and develop these areas industrially? They can if effective long-range planning becomes a basic criterion.

Commutation will increase as new expressways are built and suburban housing will rapidly expand into new tracts of land. Further development of suburbia means additional needs for sewerage, water supply, local roads and streets, airports, schools and churches. In addition, it means new opportunities for commercial enterprises.

The development of radial networks will have an impact upon commercial and industrial construction. Land costs, which are often relatively low in new developments, will encourage the decentralization of factories and warehouses. New expressways will provide them with speedy access to the central business districts, customers, and to suppliers. However, concentration of these facilities near interchanges may produce such negative results as increased land costs and localized traffic congestion.

The Interstate Highway System should have the primary effect of making intercity highway transportation cheaper, and it may have a significant effect upon competing forms of transport, especially railway transportation. Thus, a study of the economic benefits of a highway facility should include the direct benefits which accrue to the user - savings in operating costs, time costs, accident costs, and reductions in strain and annoyance of driving under unfavorable conditions, and to a limited extent the transferred benefits such as increases in property values, services by local governments, business opportunities and others. It should also include a study of the effect of the facility upon other modes of transport. In other words, the impact upon competition should become closely allied with the highway benefit - cost ratio by subtracting loss of benefits to railroads from increased benefits of the highway.

The Interstate System puts a new complexion on toll road facilities. It cuts sharply the need for, or possibility of, financing additional toll roads. Where the Interstate System offers good alternative routes, it may reduce revenues of existing toll roads. The recent incorporation of about 2100 miles of toll roads in 15 states into the Interstate System may affect this situation. This does not settle the basic question of how to pay for the toll roads which have been incorporated in the system. The problem becomes more complex by the addition of a new section from Canton, Ohio, to

Charlotte, North Carolina in the Interstate System. The proposed section includes the West Virginia Turnpike. It is apparent that the precarious financial condition of the West Virginia Turnpike could be improved by including it in the Interstate System. But does this action justify including it in the System when four basic objectives - national defense, system integration, industrial and economic development, and population - are to be served?

Speedier highway transportation may not necessarily be a blessing to urban centers. In fact, it threatens to aggravate the congestion that is already throttling the growth of many cities. Broadening the commuter area may bring increased use of the passenger car with attendant undesirable results. These additional commuters would add to the present local street and parking problem. Although facilities for off-street parking are increasing and traffic flow is being increased by various traffic engineering techniques, the solution to the congestion and parking problems is costly and it will take time to meet all requirements. Among the larger cities of North America - New York, Chicago, Detroit, Cleveland, Toronto, St. Louis, Pittsburgh, San Francisco and Los Angeles, looking for the solution to the commuter problem has been a major activity. Some have partially solved the problem through highway improvements; some have developed effective mass transportation systems; and others like Los Angeles and San Francisco are seriously considering new forms of mass transportation to supplement good highway systems. The introduction of subways has become a reality in some cities, but use of the monorail, helicopter, and moving sidewalks is in the experimental stages and cannot be expected to contribute to the alleviation of these problems in the immediate future.

Having considered some of the major affects attributable to the Federal Aid Highway Act. and some of the complications, one may also consider certain important things that it will not accomplish.

1. What will be the fate of the 2.6 million miles of roads and streets which lie outside the limited Federal Aid Systems? These highways are, and should be, the responsibility of state and local governments,

but many miles of streets in metropolitan areas are clogged with traffic densities comparable to those on the Interstate System. How to finance the improvement of these facilities remains unsolved in many states.

2. Federal aid is not available for the maintenance of roads, except for highways within the national domain. State and local responsibility for highway maintenance has had a long history. The Old National Road failed when the maintenance responsibility was assigned to the states. Will our current highway program fail because the states cannot adequately maintain their highways-interstate, state and local? Maintenance is a state responsibility, and the states must meet this challenge. Default could be chaotic.

3. Although the federal government has provided large sums for its share of the Interstate System and the other Federal Aid Systems, this does not mean that the states have adequate funds or adequate financial programs to maintain their share of the responsibility. It is entirely possible that in their efforts to meet the financial requirements of the Interstate System, a balanced program of highways will not be developed.

4. The federal government does not take responsibility for parking and terminal problems, but the accelerated program of developing urban highway transportation systems has increased the demand for some place to park the vehicle. The solution of this problem is a major headache for many municipalities.

5. The Highway Act does not concern itself with the affairs of mass transit. There is nothing in the legislation to insure that plans for public highway transportation will be properly integrated with

the plans for mass transportation. In many cases, bus transportation is replacing rail transit, but who knows how soon the trend will be reversed?

The federal government will be providing 20 to 25 per cent of all (not just interstate) highway funds in the next 15 years. The federal highway outlay was nearly $900 million in 1956 and it is expected to exceed $3 billion by 1972. Total federal and non-federal highway expenditures, which were about $8 billion in 1956, are expected to average nearly $12 billion during the last five years of the program. Capital outlay in 1956, for all roads and streets was about $5.5 billion. In 1957 it may be $5.8 billion, and in 1958 it may exceed $7 billion. By fiscal year 1961, capital outlay should be at least 40 per cent higher than in 1956 and it should continue to rise to about 50 per cent above the 1956 level by 1972. With rising costs, as shown by recent needs studies, these funds may be inadequate to construct the required highways.

In recent years most federal aid funds have been concentrated on the main rural and urban highways. These facilities include about one-eighth of the total highway mileage and carry about one-half of the traffic. But larger expenditures for highways and added capacity of the facilities have not kept pace with increased traffic. Priority construction in congested areas will accelerate capacity of the highways. The elimination of strategically placed bottlenecks will help in particular locations. In some cases feeder roads to distribute expressway traffic will be necessary. The sections with some excess capacity today will have much less need for further development. Thus a better highway system will be available in 1972, but it will not mark the end of a large-scale highway program in the United States.

There is considerable evidence that the growing inadequacy of the nation's highways should not be charged to a lack of money or resources. Nor can it be

charged to diversion of funds because the dispersion of funds appears to be the real offender. The use of resources for many miles of low-grade improvements, many on roads serving little traffic, rather than concentration of them on high-type improvements on the few miles of heavily traveled roads has been a serious offense. It is recognized that in some cases heavily traveled roads must subsidize the distributor system. Federal funds spent per vehicle mile and per ton mile on these low traffic roads in 1936 and 1950 were higher than those spent for similar services on the more important rural highways. Expenditures per vehicle mile in urban areas were less than on rural facilities. Comparisons between urban and rural expenditures on a ton-mile basis cannot be made because ton-mile data for urban areas have not been available. Although the states appear to be changing this practice of dispersion, and the 1956 federal legislation may work in this direction, the shift in highway outlays during the next 15 years may not be entirely in accord with the distribution of traffic or the origins of highway revenues.

The federal government's share of this dispersion stems from the practice of distributing funds collected from highway users on the high volume roads in the more populous states to road systems and states with little traffic. Until recently, Federal funds have been readily available for the Primary and Secondary roads, but less readily available for the Interstate and Urban as shown in Table III, Authorization of Federal-Aid Funds for Primary, Secondary, Urban and Interstate Systems for Fiscal Years, 1917-1959. As late as 1956, federal funds for Interstate and Urban projects represented less than 50 per cent of the cost of all federal aid projects completed in recent years.

An analysis of the distribution of funds to the states shows that the apportionment formulas and the matching provisions favor sparsely settled states, especially the public lands states of the mountainous west. It may be assumed that federal funds may have caused this redistribution only if one

TABLE III

AUTHORIZATIONS OF FEDERAL - AID FUNDS FOR PRIMARY, SECONDARY, URBAN AND INTERSTATE SYSTEMS FOR FISCAL YEARS 1917-1959

Fiscal Year	Primary	Secondary	Urban	Inter-State	Total
	(All figures in millions of dollars)				
1917	5				5
1918	10				10
1919	65				65
1920	95				95
1921	100				100
1922	75				75
1923	50				50
1924	65				65
1925	75				75
1926	75				75
1927	75				75
1928	75				75
1929	75				75
1930	155				155
1931	125				125
1932	245				245
1933	125				125
1936	125				125
1937	125				125
1938	125	25			150
1939	125	25			150
1940	100	15			115
1941	115	15			130
1942	100	18			118
1943	100	18			118
1946	225	150	125		500
1947	225	150	125		500
1948	225	150	125		500
1950	203	135	112		450
1951	203	135	112		450
1952	225	150	125		500
1953	225	150	125		500
1954	247	165	138	25	575
1955	247	165	138	25	575
1956	315	210	175	175	875
1957	371	248	206	1175	2000
1958	383	255	213	1700	2550
1959	394	263	219	2000	2875
TOTALS	5,893	2,441	1,938	5,100	15,372

SOURCES: Bureau of Public Roads, Highway Statistics, 1955, p. 164

assumes that, without federal aid, the states would have imposed higher taxes of various types (fuel, vehicle, property and others) equal to the federal rates producing grant-in-aid funds, and that the matching requirement caused the states to divert state raised funds from other road work. If these assumptions are valid, the more populous states and the more heavily traveled roads would be better off without federal funds. The demands for more federal funds in recent years appear to invalidate these assumptions.

Some significant shifts in the composition of the overall highway program have resulted from changed emphasis in the construction program. The Interstate System will dominate in the future. More emphasis can be expected to be placed upon the urban areas of the Interstate System because about one-half of the needs of this System are in urban areas. The urban facilities, by 1961, may be expected to absorb about one-third of all highway spending, while other roads should absorb relatively smaller shares than recently, although there are increases in absolute amounts of expenditures. The new studies of highway needs conducted by the states may be expected to show that the needs are greatest in urban areas. If this is true, and if the Federal Aid formula for distribution is changed in 1960, apportionment of Interstate Federal Aid funds will then be higher in the more urbanized states. Moreover, a shift to the 1960 Census of Population figures, probably for fiscal 1961 apportionments will increase the apportionment to fast growing urban states like California.

For some time, highways have been financed primarily from revenues collected by federal, state, and local governments - through taxes and fees paid by highway users, and borrowing to be serviced by highway user revenues. About 65 percent of all receipts for highway purposes in 1955 came direct from highway user imposts including tolls, about 12 percent came from borrowed funds (a user charge too), and the remainder from other sources, mainly local property tax revenues. The 1956 Federal Aid Act provides for an increase in

the share of funds derived from user sources. By 1961, current highway user funds may provide about 78 percent of the total highway funds. Thus borrowed funds and monies from other sources may decrease. It is possible that the expansion of local systems to carry feeder traffic may require more local funds unless the facilities are subsidized by funds earned by the more important facilities.

The Highway Cost Allocation Problem

The problem of finding an equitable basis for allocating highway cost responsibility is a most vexatious one and the subject of much controversy. This problem of how tax responsibilities are to be apportioned among the various classes of users and non-users beneficiaries of the several classes of highways has been the subject of many investigations. The names of investigators - Eastman, Morgan, Nelson, Dearing, St. Clair and Zettel are among those who have contributed significantly to the solution of this problem. They appear to agree that the pricing mechanism should be used to the fullest extent possible as a means of charging highway users for facilities provided in response to user demand. There is also agreement that subsidies should be eliminated from highway pricing (if there is subsidy) to insure economic employment of various transportation services and that monopoly profits should not be earned.

Equitable pricing of the highways is difficult because they are jointly used by automobiles, trucks and busses, private and public. Furthermore, some investigators suggest that joint benefits occur to direct beneficiaries (highway users) and to indirect beneficiaries (land use, etc.). It is recognized that these highways are built to accommodate vehicles of various sizes and weights and traffic flow of varying densities. It is widely agreed that different classes of users should be assigned separable construction and maintenance charges for the various systems and some share of common costs of

the systems. The crux of this problem appears to be the determination of how costs may be separated and how they may be distributed on an equitable basis. Many approaches to the solution of the problem have been used by investigators, but, in general, those methods most commonly used are the cost approach and the value of service approach.

The cost approach or incremental method, in general, appears to be the most valid. The pricing structure requires the determination of a basic road and the basic vehicle. But there is neither common agreement on what constitutes a basic road, nor agreement on how a basic vehicle should be defined. There is agreement, however, that vehicles should be charged for cost increments assignable to them. Although this concept appears to be relatively simple, it is much more scientific in concept then it is in application to allocation of highway costs. This approach has been rejected by some investigators because of the vast amount of data required, which is time-consuming and expensive to collect, and at times difficult to apply. The incremental method is subject to the disciplines of a competitive market and is, therefore, considered by many to be quite equitable.

The principal alternative to the cost approach method is the value of service approach, including some form of weight-distance approach. A value of service measure based on such values as savings in time and mileage must be determined to effectively apply the weight-distance approach. Essentially the weight-distance method attempts to assess benefits before they accrue.

The Federal Aid Highway Act of 1956 and the Highway Revenue Act of 1956 make it clear that an equitable pricing system must be established. The Highway Trust Fund incorporates the "linkage" concept into the Federal Aid Program. Thus, we may assume that highway user imposts at the national level assumes taxation on the basis of benefits from federal aid roads and that assessment of costs and road-user benefits will be complex. The study of

highway user benefits and cost allocation must consider all highways and all highway users. It cannot limit its research to a study of the several Federal Aid Systems. It must dig deeply into the financial problems of those facilities not included in the Federal Aid Systems because all roads are interrelated in function.

In summary, the development of an adequate highway system will require cooperation at the local, state and national level - public and private. It will require public understanding. The program will have some inertia, but full development will become more apparent when the lead time is overcome, especially in urban areas. It will also require a balanced program of interstate, state, and local highway construction.

The crux of the highway problem simmers down to the long-range pricing of transportation in a competitive market. It is through this medium that the several states and the federal government through the Bureau of Public Roads may contribute most effectively to the development of the transportation industry, of transportation policy, and of the welfare of the nation.